

INDIAN STATISTICAL INSTITUTE



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Placement Brochure

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INTRODUCTION

The Bangalore Centre of the Indian Statistical Institute was conceived by Prof.P.C.Mahalanobis during 1960s, even when the city was emerging as a centre of science. It is a tribute to his foresight that the Institute is now well-established in one of the most vibrant scientific communities in Asia.

With the Statistical Quality Control unit functioning in Bangalore from 1956, and Documentation Research and training Centre from 1962, Professor Mahalanobis thought of starting a centre of ISI around the mid-sixties. The presence of several national institutes of higher learning, the salubrious climate and the growing metropolitan culture must have prompted him to consider this possibility. In 1966, Govt. of Karnataka granted ISI 30 acres of forest land full of eucalyptus trees, next to the upcoming Bangalore University on Mysore Road, at a token price.

However, Professor Mahalanobis did not live long enough to see the realisation of his dream. Due to the difficult times that ISI went through after professor's death in 1972, the project of establishing Bangalore was temporarily shelved. It was left to Professor Kallianpur, the Director of ISI during 1976-78, to revive the idea, make concrete proposals to the Government of India and get grants for the development of the land already in possession of the Institute and the construction of an Academic Block with space for a library and offices.

In the meantime, a building was rented on Church Street, in the heart of the city, and started the activities of the Bangalore Centre in September 1978. The Statistics and Mathematics Unit (SMU) was established. The Statistical Quality Control (SQC) Unit and Documentation Research and Training Centre (DRTC), which were functioning from other rented buildings at that time came to constitute the new Centre. The Economic Analysis Unit (EAU) was established.

With the completion of the construction of the Administrative Block, the various units moved to the new campus in May 1985. However, it was only in September 1996, the Bangalore Centre was formally declared as a Centre of ISI. With the increasing faculty strength, computer and library facilities the Bangalore Centre has by now become an institution well-known for its academic activities in Mathematics and Statistics, Statistical Quality Control and Operations Research, Library and Information Science, and Quantitative Economics. Systems Science and Informatics Unit (SSIU) was added in August 2009.

DURATIONS AND VENUES OF VARIOUS PROGRAMMES

Program	Duration	Venue
Bachelors of Mathematics (Hons.)	3 years	Bangalore
Master of Mathematics	2 years	Bangalore, Kolkata
Master of Science in Library and Information Science	2 years	Bangalore
Master of Science Quality Mangement Science	2 Years	Bangalore, Hyderabad
Bachelor of Statistics (Hons.)	3 Years	Kolkata
Master of Statistics	2 Years	Kolkata, Delhi, Chennai
Master of Quantitative Economics	2 Years	Kolkata, Delhi
M. Tech in Computer Science	2 Years	Kolkata
M. Tech in Quality, Reliability and Operation Research	2 Years	Kolkata
Post Graduate Diploma in Statistical Methods	1 Years	Tezpur (Assam)
PG Diploma in Computer Applications	1 Year	Giridih

MASTER OF MATHEMATICS

Introduction

Recently, there has been an unprecedented surge in the demand for skilled people who are sufficiently accomplished in Mathematical Modelling and Data Science. With the increasing complexity and sophistication of modern industry; people who are able to formulate precise and accurate mathematical models and can implement solutions and can convey these ideas are becoming a necessary part of many organizations and companies. The M.Math program offers unparalleled training in Mathematics, from both academic and industrial perspectives so that students gain unrivalled problem solving skills based on a strong and rigorous analytical foundation. Successful completion of the course would enable students to be sufficiently adept in tackling a variety of applied math and statistical problems in any task requiring mathematical expertise.

Admission

Students with B. Math. (Hons.) Degrees from the Indian Statistical Institute are offered direct admission to the M. Math. Programme without any selection test and interview. For other eligible candidates, including students with B. Math. (Pass) degree from the Indian Statistical Institute, selection for admission to the M. Math. Programme is based on academic record, performance in written selection tests and subsequent interview.

The selection tests will comprise of objective and/or short-answer type questions in Mathematics at a level corresponding roughly to the Mathematics Honours/Mathematics Major of Indian Universities, with special emphasis on Real Analysis, Linear and Abstract Algebra.

Program Description

The programme comprises coursework in the core areas of Analysis, Algebra, Topology and Geometry reaching a level of sophistication that permit the students to go into any area of Mathematics and Applied Mathematics. Apart from the core courses, there are a number of advanced topic courses which acquaint the students with contemporary developments in the subjects. Courses like Probability Theory, Stochastic Processes, Graph Theory and Combinatorics, Automata Theory familiarise students with diverse and most successful tools in modern day application of Mathematics. A strong background in Algebra and Analysis helps them get a firm grasp on advanced courses like Measure Theory, Partial Differential Equations and Differential Geometry etc. An M.Math student acquires a strong and wide base in diverse branches of Mathematics at an early stage, and thereby equips himself/herself to make contributions in the frontiers of Mathematical research and applications.

Course Structure

The M.Math. programme comprises five courses in each of the four semesters. The courses are divided in two groups, one consisting of thirteen compulsory courses and seven optional courses.

Compulsory Courses:

- | | |
|----------------------------------|---------------------------|
| 1. Measure Theoretic Probability | 7. Functional Analysis |
| 2. Linear Algebra | 8. Algebra I |
| 3. Fourier Analysis | 9. Algebra II |
| 4. Complex Analysis | 10. Differential Topology |
| 5. Analysis of several variables | 11. Topology I |
| 6. Differential Geometry | 12. Topology II |

Optional Courses:

- | | |
|-----------------------------------|----------------------------------|
| 1. Markov Chains | 10. Commutative Algebra |
| 2. Advanced Probability | 11. Elliptic Curves |
| 3. Stochastic Processes | 12. Graph Theory & Combinatorics |
| 4. Random Walk on Graphs | 13. Algebraic Geometry |
| 5. Partial Differential Equations | 14. Ergodic Theory |
| 6. Elementary Number Theory | 15. Lie Groups |
| 7. Advanced Functional Analysis | 16. Topology III |
| 8. Operator Theory | 17. Topology IV |
| 9. Algebraic Number Theory | |

A detailed program description is available at:

<http://www.isibang.ac.in/~statmath/stinc/database/>

Students

- The success rate in the ISI admission process is 1 out of 150, in comparison to 2% for the IITs and IIMs, and an even lower success rate of B. Stat. (Hons.) admission test, where a meagre number of around 50 are selected compared to thousands in case of IITs .
- Even the selected students undergo rigorous training and course-work, under the best tutors in the field, and only those who keep to the standards survive the entire course.
- Students being awarded the best national scholarships like KVPY, NBHM, NTSE, INSPIRE and having won reputed national and international level Olympiads testify their highest levels of excellence.

Current Batch Strength

27 students (26 male/1 female)

Master of Science in Quality Management Science

Introduction

Master of Science in Quality Management Science is a two year programme, offered by Indian Statistical Institute in two campuses, Bengaluru (First year) and Hyderabad (Second year). Both the campus focusses on separate area of applied statistics and business analytics in accordance with its expertise and competence.

The programme is designed in such a way that the students (having expertise in Engineering, Statistics and Mathematics) are given sound theoretical knowledge with live project applications needed for **Business Analytics, Data Science, Quality Management, Machine Learning, Optimization and Statistical Modelling.**

To apply the concepts learned in the course duration, it is required to undertake a project in an industry, having credit in fourth semester (Feb'18 – June'18) in the field of Quality/ Operations Research/ Business Analytics/ Data Science/ Machine Learning.

Mission

To develop professionally competent specialists for industry, trade and administration. To undertake project studies, research and allied methods for the improvement of efficiency and national productivity, as well as the lowering of costs of goods and services.

Values

1. Deliver lasting, breakthrough results by integrating technical / operational, cultural, customer and leadership aspects of improvements
2. Transfer capability to customer organizations to sustain and replicate improvements, independent of consultants
3. Deploy seasoned consultants with experience to the field
4. Interdisciplinary team work for and with customer

Batch Profile

Average Age	25 Years
Average Work Experience	24 months

Industries/Sectors represented	Banking Retail, E-commerce, Manufacturing, Finance, Aerospace, Banking Retail, Finance, Technology Consulting, Oil & Gas
Name of companies represented (Current Batch 2016-18)	ANZ, Boeing, Snapdeal, Kirloskar, TVS, TCS, Infosys, Amec Foster Wheeler, Novel Synth, Mactores, TechMeda, DexLab Analytics
Software skills	Python, R, Minitab'17, Arena, SAS, SPSS, Lingo, Open solver, Matlab, Octave, SQL/PISql, MS Office(Excel, Word, PowerPoint), C, C++, Java, C#

Course Structure

The course is divided into four semesters with the following major topics:

Compulsory Courses:

Semester I (at ISI Bangalore):

1. Inferential statistics I (SDM-I)
2. Project Management
3. Reliability, Maintainability and Safety-I (RMS-I)
4. Linear Programming and Optimization (OR-I)
5. Total Quality Management (TQM)
6. Statistical Process Control (SPC)

Semester II (at ISI Bangalore):

1. Inferential statistics II (SDM-II)
2. Multivariate analysis (MVA)
3. Pattern recognition
4. Troubleshooting and problem solving
5. Integer, dynamic and goal Programming (OR-II)
6. Advanced statistical process control (ASPC)
7. Reliability, maintainability and safety-II (RMS-II)

Semester III (at ISI Hyderabad):

1. Applied regression analysis (ARA)
2. Convex optimization and Non-linear programming (NLP)
3. Design of experiments (DOE)
4. Six sigma for business excellence (SSBE)
5. Quality audit (QA)
6. Dissertation (for 2 months)

Semester IV:

Industrial internship for 4-5 months in an organization under professor's guidance.

Master of Science in Library and Information Science

Introduction

The Documentation Research & Training Centre (DRTC), a unit of ISI, founded by Prof. S. R. Ranganathan is an internationally recognized centre for advanced training and research in Library and Information Science. DRTC has been conducting an Associate ship Programme since 1962 which is upgraded to a 2 years Master's degree programme with the primary objective of preparing the next generation information and knowledge managers. The course structure is ICT intensive and is developed in such a way that students who complete the course would be competent to work in leading research, S&T organization libraries, IT industry, R&D organizations and institutions of higher education & research.

Eligibility

The minimum qualification for admission to the M.S. in Library and Information Science programme is a Bachelor's degree in any discipline from a recognized Indian or foreign university. Selection of candidates is based on academic records and performance in written test and interview.

Programme Description

With the emergence of knowledge centered economy and the knowledge society, information & knowledge management has emerged as a major area of study and importance to large corporate houses, R&D Institutions and Governments. DRTC-ISI conducts advanced educational and research programmes for information professionals.

Course Structure

The course is divided into four semesters with the following major topics:

Semester 1:

- Foundations of Library and Information Science.
- Information Organization.
- Cataloguing and Metadata.
- Foundations of Computer and Information Technology.
- Library Management and Library Automation.
- Elements of Mathematics-I

Semester 2:

- Information Sources, Systems and Services.
- Elements of Statistics and Research Methodology.

- Digital Libraries.
- Data Structures and Programming.
- Colloquium.
- Elements of Mathematics-II

Semester 3:

- Information Storage, Retrieval and DBMS.
- Content Management Systems.
- Informetrics and Scientometrics.
- Web Technology and Web-based Information services.
- Seminars.

Semester 4:

- Networking Technologies and Library Networks.
- Knowledge Management Systems.
- Semantic Web.
- Dissertation/Project Work.

Electives:

One of the following subjects has to be chosen by a student as an elective:

- Data & Text Mining.
- Geographic Information System (GIS).

Our strengths

- Digital Libraries and data repositories.
- Use of statistical software packages (Matlab)
- Use of Library automation and Open Data Repository Software (koha, Dspace, Dataverse)
- Web/Portal designing using CSS, HTML, XML, Java Script ,PHP & Content Management Systems (Drupal, Joomla)
- Networking technology & Library networks
- Ontology & linked data tools
- General tools such as mysql, PostgreSql, SpaRQL

Some indicative universities and companies where our alumni are working

Universities and Organizations (select indicative):

Jawaharlal Nehru University, Delhi
 Banaras Hindu University, Varanasi
 University of Calcutta, Kolkata
 ISRO, DRDO, CSIR, IITs IIMs
 TERI,

Delhi Companies (select, indicative):

IBM, Accenture, Vodafone, TCS, Honeywell.

Indicative job titles:

Information Manager, Knowledge Manager, IRC Managers, Librarians, Researchers and Academic designations.

Current batch strength

II-year students: 10(8 male/2 female)

I-year students: 17(13 male/4female)

Bachelors in Mathematics

Introduction

With the increasing complexity and sophistication of modern industry; people who are able to formulate precise and accurate mathematical models; who can implement solutions and can convey these ideas are becoming a necessary part of many organizations and companies. The B Math program offers advanced level training in Mathematics, so that students gain good analytical and problem solving skills built upon a background of Mathematics, Statistics and basic sciences. On successful completion of the course (depending on electives) students would be able to work in different areas of industry.

Scope

The B.Math.(Hons.) degree programme offers comprehensive instruction in basic mathematics along with rudimentary courses in probability, Statistics, Computing and Physics. It is so designed that on successful completion, the students would be able to pursue higher studies in the areas of Mathematics, Statistics, Computer Science, Mathematical Physics or take up a career in applications of Mathematics. The total duration of the B.Math.(Hons.) programme is three years.

Method of Selection

Each candidate applying for admission to this programme has to take a selection test comprising objective type and short answer type questions in Mathematics at the Higher Secondary level (10+2 years programme). Based on performance in the tests, a selected list of candidates are called for Interviews. The final list of candidates selected for admission to the programme is announced after the interviews. Also students selected for INMO are directly called for interviews.

Course Structure

The B.Math Program comprises four courses each in the first two semesters and five each in the last four. The courses are divided into 25 compulsory courses and 3 elective courses, plus a maximum of 3 non-credit.

Compulsory Courses:

- | | |
|-------------------------------|--|
| 1. Calculus in one variable | 15. Field and Galois Theory |
| 2. Probability I | 16. Statistical Inference |
| 3. Group Theory | 17. Topology |
| 4. Programming in C | 18. Numerical Methods Matlab |
| 5. Multivariate Calculus | 19. Complex Analysis |
| 6. Probability II | 20. Differential Geometry |
| 7. Linear Algebra | 21. Electrostatics & Magnetism |
| 8. Classical Mechanics | 22. Regression Analysis |
| 9. Vector Calculus | 23. Fourier Series and Function Spaces |
| 10. Rings and Modules | 24. Differential Equations |
| 11. Exploratory Data Analysis | 25. Quantum Physics & Relativity |
| 12. Thermodynamics & Optics | |
| 13. Optimization | |
| 14. Graph Theory | |

Elective Courses: (3 have to be chosen)

- | | |
|-----------------------------------|----------------------------------|
| 1. Representation Theory | 11. Applied Stochastic Processes |
| 2. Dynamical Systems | 12. Discrete Data Analysis |
| 3. Stochastic models in Insurance | 13. Design of Experiments |
| 4. Statistical Computing | 14. Theory of Computation |
| 5. Algebraic Geometry | 15. Mathematical Morphology |
| 6. Differential Geometry II | 16. Design of Algorithms |
| 7. Differential Topology | 17. Data Structures |
| 8. Topics in Optimization | |
| 9. Combinatorics | |
| 10. Markov Chains | |

Batch Strength

3rd year:23 (1 female/22 male)

2nd year:34 (3 female/31 male)

1st year: 26 (3 female/23 male)

Academic Calendar for 2017-2018

Semester I : July 26th 2017 to November 24th 2017

Winter break: November 25th 2017 to January 09th 2018

Summer break: May 10th, 2018 to July 2018

Semester II : January 10th to May 09th 2018

Placement Guidelines

- Placement of ISI students is facilitated by the Placement Committee.
- All correspondences in this regard should be made with the Placement Committee. Please email us at plcconv@isibang.ac.in (mark subject: Placement).
- Students of the B.Math, M. Math., M.S.(QMS), and MSLIS courses passing out in July 2018, are eligible for placement.
- Students of different courses are available for internships during their summer break which generally spans from mid-May to mid-July and winter break which spans from mid-November to mid-January.
- Students (currently enrolled) of the B.Math, M. Math., M.S.(QMS), and MSLIS courses are eligible for summer and winter internships.
- The placement session for 2017-18 begins from September 2017.
- ISI does not charge any Placement Fee.

Campus Recruitment procedure

- Companies interested in conducting campus recruitment need to send the duly filled-in [Campus Recruitment Form \(ISI-CRF\)](#), preferably with relevant company literature, by email/fax/courier/post to the Convener, Placement Committee. This provides the primary basis of communicating the details of the positions offered to the students.
- Companies interested in providing internships to students need to send the duly filled-in [Student Internship Form \(ISI-CRF\)](#), preferably with relevant company literature, by email/fax/courier/post to the Convener, Placement Committee. This provides the primary basis of communicating the details of the positions offered to the students.
- Based on the feedback of the students and other institute activities, a mutually convenient date (single day) for the company visit is finalized by the Convener, Placement Committee. This booking is done on a first-come first-serve basis.
- Any specific requirement of the company (especially for briefing company profile to the students) has to be communicated to the Convener, Placement Committee at least one week in advance to avoid any inconvenience during their campus visit.
- Companies will be assigned only one day for the complete recruitment process and they have to declare the final list of selected students at the end of the day. Please use [Result Declaration form](#), if you don't have your own declaration format.
- Detailed offer letter may be sent to the Convener, Placement Committee for distribution among the selected students. The Convener will coordinate in sending back letters of acceptance to the employer from students.
- Students will join the companies only after the completion of their respective courses.
- The date of joining should preferably be within one month from the official date of completion of the respective course.
- Campus recruitment by placement consultants or third-party recruiters is not permitted.